

Clinical Characteristics of Biological Terrorism Agents

Disease (Causative agent)	Incubation Period	Early Symptoms/ Prodrome	Highly suggestive signs/ Clinical syndrome	Diagnostic Samples (BSL level)	Diagnostic Assay (Characteristic findings)	Infection Control/ Isolation	Adult Treatment*	Post-Exposure Prophylaxis*
Inhalational Anthrax (<i>Bacillus anthracis</i>)	1-6 days (up to 42 – 60 days reported in literature)	Non-specific: fever, malaise, cough, dyspnea, headache, chills, weakness, vomiting, abdominal and chest pain	Widened mediastinum on chest X-ray in a previously healthy febrile person Brief (0-3 d) improvement after prodrome, then rapid onset of severe resp. distress, stridor, resp. failure (due to hemorrhagic mediastinitis and thoracic lymphadenitis), shock, and death w/in 24-36 hrs. Parenchymal infiltrates unusual. Hemorrhagic meningitis may also occur.	Blood, CSF; pleural or ascitic fluid (BSL-2)	Gram stain (can be done on unspun blood) or Wright stain; culture (positive w/in 6-24 hrs) Antigen detection (DFA, ELISA, and PCR in ref labs only). (<i>Large gram positive encapsulated bacilli, non-hemolytic, non-motile</i>)	No person to person transmission. Isolation not required. Standard precautions. Decontaminate accidental spills of potentially contaminated material using disinfectant (5% hypochlorite).	<u>Penicillin-resistant or unknown sensitivity</u> : Ciprofloxacin 400 mg IV q 12 (alternatives may include other quinolones, though not FDA-approved for this use); Doxycycline 200 mg IV then 100 mg IV q 12 <u>Known penicillin-sensitive</u> : Penicillin G 4 million U IV q 4; amoxicillin 500 mg IV q 8 <u>Duration</u> : 60 days unless vaccinated. Use oral meds if condition improves or in mass casualty situation with limited IV medications	<u>Penicillin-resistant or unknown sensitivity</u> : Ciprofloxacin 500 mg PO bid (alternatives may include other quinolones, or doxycycline) <u>Known penicillin-sensitive</u> : Amoxicillin 500 mg PO tid or doxycycline 100 mg bid <u>Duration</u> : 60 days (if vaccinated, then 30 days) <u>Vaccine</u> , if available, on days 0, 14 and 28 (vaccine currently unavailable)
Smallpox (Variola virus) Note: If smallpox is suspected, report case immediately – before obtaining diagnostic samples.	7-17 days (avg 12-14 days)	Non-specific: fever, malaise, headache, prostration, rigors, vomiting, severe backache	Centrifugal, synchronous rash (all lesions at same developmental stage) Maculopapular, vesicular, then pustular, begins on face, mucus membranes, hands and forearms, may include palms and soles, spreads to lower extremities and then to trunk; lesions deeply seated in dermis. Death in ~ 35%.	Vesicular or pustular fluid, pharyngeal swab, scab material (BSL-4)	PCR, viral isolation, electron or light microscopy, serology. Diagnostic testing available at CDC only. (<i>200 nm brick-shaped DNA virus [orthopoxvirus]</i>)	Highly transmissible: Isolation required. (negative pressure, HEPA filtration). Contact and airborne precautions for 17 days following exposure. Pt. most infectious for the 7-10 d following onset of rash.	Supportive care, antibiotics as indicated to treat secondary infection	Vaccination within 4 days of exposure, VIG (0.6 ml/kg IM within 3 days) for serious complications of smallpox vaccination. Note: neither smallpox vaccine nor VIG are commercially available. Would only be released by CDC if smallpox case(s) confirmed.
Pneumonic Plague (<i>Yersinia pestis</i>)	1-6 days (avg 2-4 days)	Non-specific: high fever, cough, chills, dyspnea, headache, hemoptysis, GI symptoms common	Fulminant pneumonia, often with hemoptysis , rapid progression of respiratory failure, septicemia and shock. Pneumonic consolidation on X ray and hemoptysis distinguish plague from inhalational anthrax.	Blood, sputum, lymph node aspirate; serum (BSL-2/3)	Gram, Wright, Giemsa, Wayson or FA stain; culture; rapid assays (ELISA, DFA., PCR) in ref. labs (<i>Gram negative coccobacilli, "safety-pin" bipolar staining</i>)	Highly transmissible. Resp isolation until pt. has been treated with antibiotics for 48-72 hrs. Droplet precautions until patient treated for 3 days.	Streptomycin 1 gm IM BID; gentamicin 5 mg/kg IM or IV q 24 or 2 mg/kg loading dose followed by 1.7 mg/kg IM or IV q 8; in mass casualty situation: doxycycline 100 mg PO bid; ciprofloxacin 500 mg PO bid <u>Duration</u> : 10 days	Doxycycline 100 mg PO bid; ciprofloxacin 500 mg PO bid <u>Duration</u> : 7 days
Tularemia (<i>Francisella tularensis</i>)	2-10 days (avg 3-5)	Non-specific: fever, fatigue, chills, cough, malaise, body ache, headache, chest discomfort, GI symptoms	Pneumonitis, ARDS, pleural effusion, hemoptysis, sepsis. Ocular lesions, skin ulcers, oropharyngeal or glandular disease possible.	Blood, serum, sputum, pharyngeal washing, fasting gastric aspirate, ulcer swab, lymph node aspirate (BSL-2/3)	Gram stain, culture (slow growth - use cysteine-enriched media). DFA or IHC staining of secretions, exudates or biopsy specimens. <i>Small gram negative coccobacilli</i>	Standard precautions In laboratory, handle all specimens in BSL-3 environment.	Streptomycin 1 g IM bid; gentamicin 5 mg/kg/day IM or IV qd; fluoroquinolones may also be effective for treatment. <u>Duration</u> : 10-14 days	Doxycycline 100 mg PO bid; ciprofloxacin 500 mg PO bid <u>Duration</u> : 14 days
Botulism (<i>Clostridium botulinum</i> toxins)	2 hours-8 days (avg 1-3 days) Foodborne: 12-36 hrs Inhalational: 24-48 hrs	Usually none. If foodborne, possibly nausea, vomiting, abdominal cramps or diarrhea	Acute, afebrile, alert, pt symmetrical cranial nerve palsies & descending paresis/flaccid paralysis Bulbar symptoms: ptosis, diplopia, dysarthria, dysphonia, dysphagia, generalized muscle weakness, paralysis, airway obstruction and resp. failure	Nasal swab (if obtained immediately following exposure), serum (BSL-2)	Clinical diagnosis. Mouse bioassay for toxin (takes 1-2 days). Available at NYCDOH Public Health Laboratories only (tel: 212-447-6749).	Standard precautions	Supportive care (long term ventilation may be needed.) CDC trivalent equine antitoxin for serotypes A, B, E; DOD heptavalent antitoxin for serotypes A-G. (need to screen for hypersensitivity prior to administration of antitoxin.) Call NYCDOH to request antitoxin.	None

Clues to a possible bioterrorist attack: single cases of disease due to uncommon, non-indigenous agents in patients with no history suggesting an explanation for illness; clusters of patients with similar syndrome with unusual characteristics (e.g., unusual age distribution) or unusually high morbidity and mortality; unexplained increase in the incidence of a common syndrome above seasonally-expected levels (e.g., increase in influenza-like illness during summer. **Any unusual disease pattern should be reported immediately to the Iowa Department of Public Health: 800 362-2736 (during normal business hours) or 515-323-4360 (after hours).**

- Recommendations are taken from JAMA consensus statements on key bioterrorist agents, published from May 1999 – June 2001 (see <http://jama.ama-assn.org>). These are not official IDPH recommendations; they are provided for information only. The table also does not include specific recommendations for children or pregnant women – suggested therapy / prophylaxis for these groups may be found in the consensus statements.